

## Heidar Thor Thrastarson - Curriculum Vitae

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### SKILLS

**Analysis of large datasets** - experience working with reduction and analysis of large datasets, in particular Radio Occultation satellite observations for Earth's atmosphere

**Atmosphere/climate models** - experience adapting and running 3-D General Circulation Models (GCMs) under various conditions for Earth and other planets, as well as 1-D radiative-convective atmospheric models, and using and writing software for analysis of results.

**General fluid dynamics numerical modeling** - including astrophysical protoplanetary disk simulations.

**Medical radiation physics, measurements and dose planning** - experience working in radiotherapy, with dose planning, measurements for quality control and general problem solving.

**Programming languages and software:** Fortran 90, Python, NCAR Command Language (NCL), shell scripting, L<sup>A</sup>T<sub>E</sub>X, MATLAB, Mathematica, IDL, MS Office.

**Operating Systems:** Mac OS X, Unix/Linux, Windows.

### RESEARCH INTERESTS AND AREAS OF EXPERTISE

Dynamics and physics of planetary atmospheres, including boundary layers, clouds and convection, wave-flow interaction, large scale variability, thermodynamic structure and comparative climatology

Physical and numerical aspects of fluid dynamical models, including Global Climate Models and radiative-convective models

Observational atmospheric data analysis and application, in particular satellite radio occultations

Climate and health applications, using climate data in epidemiological models for diseases

Characterization of extrasolar planets

Astrophysical fluid dynamics

### EDUCATION

**Queen Mary University of London, UK**

*Oct 2007 - Nov 2011*

PhD in astrophysics.

*"General Circulation Modelling of Close-in Extrasolar Giant Planets".*

Thesis advisor: Dr. James Y-K. Cho.

**Uppsala University, Sweden**

*Aug 2005 - Sep 2007*

MSc in physics, specializing in astrophysics.

Dissertation: *"Radiation Energy Transport in Hydrodynamical*

*Models of Protoplanetary Disks".* Advisor: Dr. Nikolai Piskunov.

**University of Iceland, Reykjavik**

*Aug 1999 - Jun 2003*

B.Sc. in Physics.

PROFESSIONAL  
EXPERIENCE

**Joint Institute for Regional Earth System Science and Engineering,  
University of California, Los Angeles,**  
*Assistant Researcher*

*From May, 2015*

**Jet Propulsion Laboratory, California Institute of Technology,**  
Pasadena, California  
*Caltech Postdoctoral Scholar*

*Mar, 2015 - Apr, 2015*

**Jet Propulsion Laboratory, California Institute of Technology,**  
Pasadena, California  
*NASA Postdoctoral Fellow*

*Nov, 2011 - Feb, 2015*

**Swedish 1-meter Solar Telescope,**  
Roque de los Muchachos, La Palma, Spain  
*Observations assistant*

*Jun - Aug, 2007*

**Landspítali - University Hospital,**  
Department of Radiation Physics  
Reykjavik, Iceland  
*Physicist in Radiotherapy for Cancer*

*Sep, 2003 - Aug, 2005 and Jun - Aug, 2006*

**Iceland Science Institute,**  
Reykjavik, Iceland  
*Research Assistant*

*Jun - Aug, 2003 and Jun - Aug, 2002*

MENTORING

**Queen Mary University of London, UK**  
*Teaching Assistant*

*2007-2010*

Taught exercise classes/tutorials and marked coursework for first and second year university level Calculus and Engineering Maths.

**Iceland Technical University, Reykjavik, Iceland**  
*Teaching Assistant*

*Spring, 2004 and 2005*

Supervised experiments in a radiation physics course for radiology students.

**University of Iceland, Reykjavik, Iceland**  
*Teaching Assistant*

*Aug - Dec, 2004*

Mentored a group of engineering students in the experimental part of a first year university physics course.

GRANTS AND  
AWARDS

JPL Outstanding Postdoc Research Award, Planetary Science and Life Detection (2013)

NASA Postdoctoral Program Fellowship.

Royal Astronomical Society Research and Grants Fund.

Awarded to support attendance at the KITP program, The Theory and Observation of Exoplanets.

Institute of Physics Research Student Conference Fund.

CR Barber Trust Fund, Institute of Physics.

Center for Planetary Science Travel Grant.

Funding for the CPS School of Planetary Science, Kobe, Japan.

Anna and Allan Löfbergs stipend.

A grant awarded to young scientists, aimed at research on the origin of planetary systems.

SEMINARS AND  
PRESENTATIONS

- Retrieving Stratopause Height from COSMIC Radio Occultation Data* Dec, 2014  
Talk given at the Fall Meeting of the American Geophysical Union, San Francisco, CA.
- Estimated Stratopause Height and its Distance to the Cold Point Tropopause from COSMIC Radio Occultations* Sep, 2014  
Poster presented at the 8th FORMOSAT-3/COSMIC Data Users' Workshop, Boulder, CO.
- Circulation Models of Close-In Exoplanet Atmospheres.* Sep, 2013  
Talk given at the European Planetary Science Congress, London, UK.
- Exoplanet Weather and Climate Modelling.* Sep, 2013  
Seminar given at the University of Iceland, Reykjavik.
- Circulation and Variability of Close-In Exoplanet Atmospheres.* July, 2013  
Poster presented at the JPL Postdoc Research Day, Pasadena, CA.
- General Circulation and Variability of Close-In Exoplanet Atmospheres.* June, 2013  
Poster presented at the AGU Chapman Conference: Crossing the Boundaries in Planetary Atmospheres - From Earth to Exoplanets. Annapolis, MD
- General Circulation Modelling of Close-in Extrasolar Planets* June, 2013  
iPLEX Lunch Seminar, UCLA, Los Angeles, CA.
- General Circulation and Variability of Close-In Exoplanet Atmospheres.* Dec, 2012  
Poster presented at the Fall Meeting of the AGU, San Francisco, CA.
- Intercomparison of GCMs for Hot Extrasolar Planets and General Circulation and Variability of Close-In Exoplanet Atmospheres.* Sep, 2012  
Talks given at the European Planetary Science Congress, Madrid, Spain.
- Circulation and Variability of Close-In Exoplanet Atmospheres.* July, 2012  
Poster presented at the JPL Postdoc Research Day, Pasadena, CA.
- General Circulation Modeling of Hot Jupiters.* June, 2012  
Talk given at a Workshop on Stochastic Flows and Climate Modeling, Aspen Physics Center, CO.
- General Circulation Modeling of Close-in Extrasolar Planets* Feb, 2012  
Yuk Lunch Seminar, California Institute of Technology, Pasadena, CA
- Atmospheric Dynamics of Hot Jupiters* Feb, 2011  
Talk given at the RAS Specialist Discussion Meeting, Dynamics and Composition of (Exo)Planet Atmospheres, Royal Astronomical Society, London, UK
- General Circulation Modeling of Close-in Extrasolar Planets* May, 2010  
Talk given at the Astrophysics and Exoplanet Science Seminar, JPL, Pasadena, CA
- General Circulation Modeling of Close-in Extrasolar Planets* Mar, 2010  
Poster presented at the conference, Exoplanets Rising, Kavli Institute of Theoretical Physics, Santa Barbara, CA
- General Circulation Modeling of Close-in Extrasolar Planets* Jan, 2010  
Poster presented at the CPS 6th International School of Planetary Sciences – Planetary Atmospheres, Kobe, Japan

PEER-REVIEWED  
PUBLICATIONS

**Thrustarson, H. Th.** & Cho, J.Y-K. 2010. “*Effects of Initial Flow on Close-in Planet Atmospheric Circulation*”. *Astrophysical Journal*, Volume 716, Issue 1, pp. 144-153.

**Thrustarson, H. Th.** & Cho, J.Y-K. 2011. “*Relaxation Time and Dissipation Interaction in Hot Planet Atmospheric Flow Simulations*”. *Astrophysical Journal*, Volume 729, pp. 117.

Polichtchouk, I., Cho, J.Y-K, Watkins, C., **Thrustarson, H. Th.**, Umurhan, O.M. & de la Torre Juarez, M. 2014. “*Intercomparison of General Circulation Models for Hot Extrasolar Planets*”. *Icarus*, Volume 229, pp. 355-377.

Cho, J. Y-K., Polichtchouk, I. & **Thrustarson, H. Th.** 2015. “*Sensitivity and Variability Redux in Hot-Jupiter Flow Simulations*”. *Monthly Notices of the Royal Astronomical Society*, Volume 454, pp. 3423-3431.

OTHER  
PUBLICATIONS

Cho, J. Y-K. & **Thrustarson, H. Th.** 2014. “*Atmospheric Dynamics with EChO*”. Exoplanet Characterisation Observatory (EChO) Assessment Phase Payload Study.

PROFESSIONAL  
ACTIVITY

Review Panel service for NASA

Referee for *The Astrophysical Journal* and *Icarus*.

Member of the Kavli Institute of Theoretical Physics program *Wave-Flow Interaction in Geophysics, Climate, Astrophysics, and Plasmas*, in Santa Barbara, March - June, 2014.

Convener for the session *Nonlinear Processes in Planetary Atmospheres and Protoplanetary Disks* at the Fall Meeting of the American Geophysical Union, December, 2012.

Participant in the *Workshop on Stochastic Flows and Climate Modeling* at the Aspen Physics Center, May - June, 2012.

Affiliate member at the Kavli Institute of Theoretical Physics program *The Theory and Observations of Exoplanets*, in Santa Barbara, March - May, 2010.

Leader and organizer of weekly meetings of the Planetary Atmospheres and Dynamics group, University of London, 2009-2010.

Member of the American Geophysical Union.

LANGUAGES

Icelandic (native language), fluent English and Swedish, good knowledge of Danish, basic Spanish, German, French and Italian, understand Norwegian.

REFEREES

1. Dr. **James Y-K. Cho** (email: j.cho@qmul.ac.uk)  
Queen Mary University of London  
Mile End Road, London E1 4NS, UK

2. Dr. **Pin Chen** (email: pin.chen@jpl.nasa.gov)  
Jet Propulsion Laboratory, California Institute of Technology  
4800 Oak Grove Drive, Pasadena 91109, CA, USA

3. Dr. **Manuel de la Torre Juarez** (email: mtj@jpl.nasa.gov)  
Jet Propulsion Laboratory, California Institute of Technology  
4800 Oak Grove Drive, Pasadena 91109, CA, USA